

Figure 6 Mitochondria break down sugar and make ATP. ATP is produced on the inner membrane.

mitochondrion in eukaryotic cells, the cell organelle that is surrounded by two membranes and that is the site of cellular respiration

Mitochondria

A mitochondrion (MIET oh KAHN dree uh) is the main power source of a cell. A **mitochondrion** is the organelle in which sugar is broken down to produce energy. Mitochondria are covered by two membranes, as shown in **Figure 6**. Energy released by mitochondria is stored in a substance called *ATP* (adenosine triphosphate). The cell then uses ATP to do work. ATP can be made at several places in a cell. But most of a cell's ATP is made in the inner membrane of the cell's mitochondria.

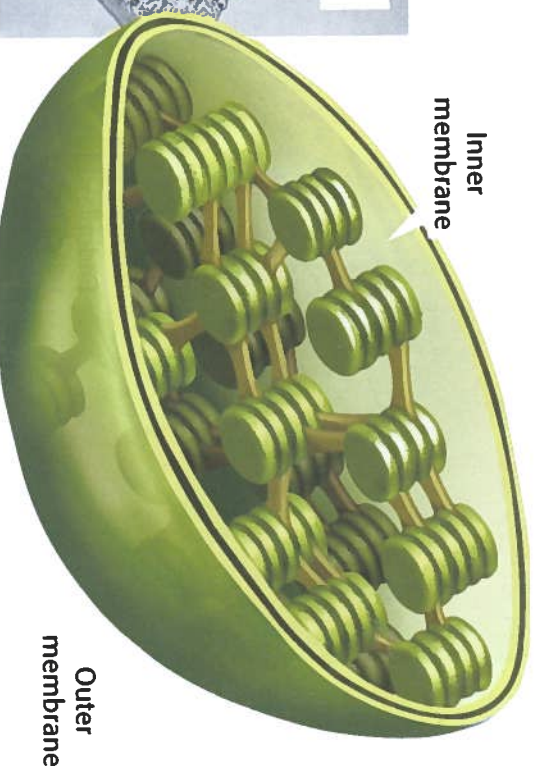
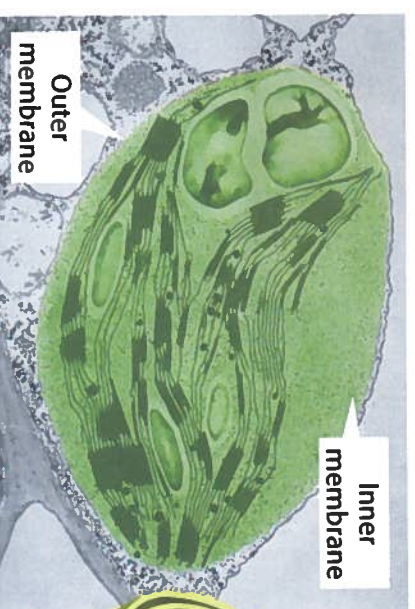
Most eukaryotic cells have mitochondria. Mitochondria are the size of some bacteria. Like bacteria, mitochondria have their own DNA, and mitochondria can divide within a cell.

Reading Check Where is most of a cell's ATP made?

Chloroplasts

Animal cells cannot make their own food. Plants and algae are different. They have chloroplasts (KLAWR uh PLASTS) in some of their cells. *Chloroplasts* are organelles in plant and algae cells in which photosynthesis takes place. Like mitochondria, chloroplasts have two membranes and their own DNA. A chloroplast is shown in **Figure 7**. *Photosynthesis* is the process by which plants and algae use sunlight, carbon dioxide, and water to make sugar and oxygen.

Chloroplasts are green because they contain *chlorophyll*, a green pigment. Chlorophyll is found inside the inner membrane of a chloroplast. Chlorophyll traps the energy of sunlight, which is used to make sugar. The sugar produced by photosynthesis is then used by mitochondria to make ATP.



Inner membrane

Outer membrane

Golgi Complex

The organelle that packages and distributes proteins is called the **Golgi complex** (GOHL jee KAHM PLEKS). It is named after Camillo Golgi, the Italian scientist who first identified the organelle.

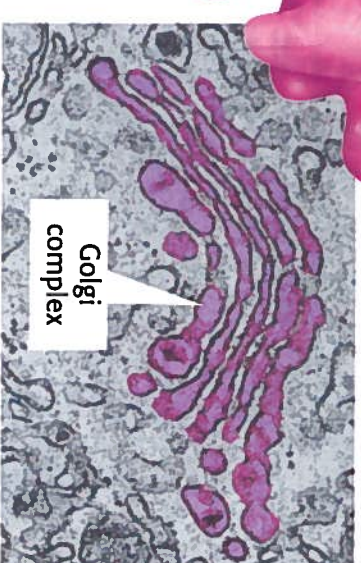
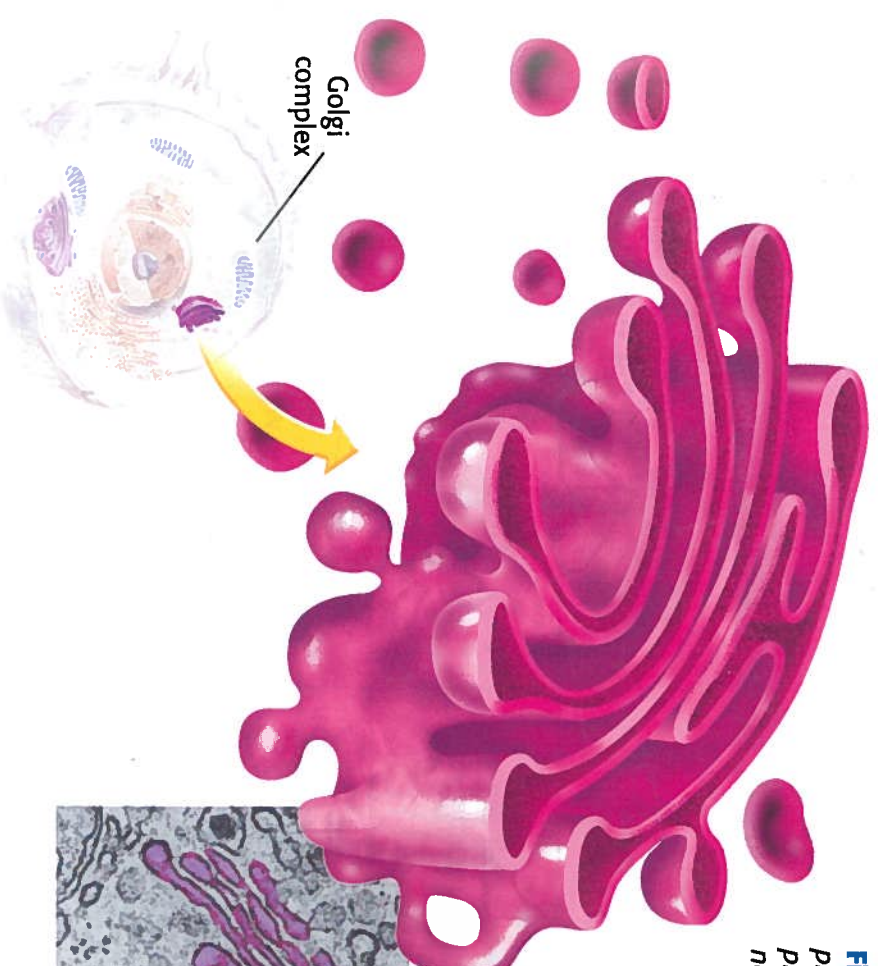
The Golgi complex looks like smooth ER, as shown in **Figure 8**. Lipids and proteins from the ER are delivered to the Golgi complex. There, the lipids and proteins may be modified to do different jobs. The final products are enclosed in a piece of the Golgi complex's membrane. This membrane pinches off to form a small bubble. The bubble transports its contents to other parts of the cell or out of the cell.

Cell Compartments

The bubble that forms from the Golgi complex's membrane is a vesicle. A **vesicle** (VES i kuhl) is a small sac that surrounds material to be moved into or out of a cell. All eukaryotic cells have vesicles. Vesicles also move material within a cell. For example, vesicles carry new protein from the ER to the Golgi complex. Other vesicles distribute material from the Golgi complex to other parts of the cell. Some vesicles form when part of the cell membrane surrounds an object outside the cell.

Golgi complex cell organelle that helps make and package materials to be transported out of the cell

vesicle a small cavity or sac that contains materials in a eukaryotic cell



Golgi complex

Figure 8 The Golgi complex processes proteins. It moves proteins to where they are needed, including out of the cell.